1986-1987 WINTER TRACK TRANSECTS
FUNDY NATIONAL PARK

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Resource Conservation
Fundy National Park

TABLE OF CONTENTS

	PAGE
ABSTRACT	iii
METHODOLOGY	1
RESULTS	4
White-tail Deer (Figure 3)	4
Moose (Figure 4)	6
Squirrel (Figure 5)	6
Porcupine (Figure 6)	9
Bobcat (Figure 7)	9
Red Fox (Figure 8)	9
Mice (Figure 9)	9
Fisher (Figure 10)	14
Weasel (Figure 11)	14
Mink (Figure 12)	14
Otter (Figure 13)	14
Lynx (Figure 14)	14
Marten (Figure 15)	20
Varying Hare (Figure 16)	20
Coyote (Figure 17)	20
DISCUSSION	26
LITERATURE CITED	
APPENDICES	

LIST OF FIGURES

		PAGE
Figure 1	Track Transect Data Sheet	2
Figure 2	Track Transects and Areas 1-4	3
Figure 3	Track Indices for White-tailed Deer	5
Figure 4	Track Indices for Moose	7
Figure 5	Track Indices for American Red Squirrel	8
Figure 6	Track Indices for American Porcupine	10
Figure 7	Track Indices for Bobcat	11
Figure 8	Track Indices for Fox	12
Figure 9	Track Indices for Mice	13
Figure 10	Track Indices for Fisher	15
Figure 11	Track Indices for Weasel	16
Figure 12	Track Indices for American Mink	17
Figure 13	Track Indices for River Otter	18
Figure 14	Track Indices for Lynx	19
Figure 15	Track Indices for American Marten	21
Figure 16	Track Indices for Varying Hare	22
Figure 17	Track Indices for Coyote	23
Figure 18	Track Indices for Predators	24
Figure 19	Track Indices for Major Prey Species	25

ABSTRACT

This report is an annual update of the track transect survey initiated in Fundy National Park in 1977. The objective of this study is to compare mammal population densities and winter distribution of mammals through the use of track indices and was originally established by the Canadian Wildlife Service.

The field work consists of walking selected transect lines through representative habitat types and identifying and counting tracks for all mammal species encountered. In 1986-87 this field work was carried out between January and March. Track indicies are later calculated for each species in relative population densities of most mammal species; there was a slight increase in coyote indices with accompanying decrease in bobcat and fox indices. Further studies will be required to determine if a correlation exists between these changes.

It should be noted that this is a progress report only and this paper should not be referenced without citing its progress report status. For an overall insight into this study, reference should be made to all previous track transect reports.

METHODOLOGY

Transects were selected on the basis of accessibility, topography, forest cover type and location within the Park (Bateman, 1977). Transect lines were in a magnetic east-west direction beginning at a road or trail accessible by car or snowmobile.

Biophysical maps (1:12,500) prepared by the Forest Management Institute were used to measure the distance which each transect passed through major vegetation types - softwood (30%), hardwood (8.2%), mixed wood (57%) and other (4.3%). Unforested areas such as bogs, old fields, roads, streams, and alder swales were grouped as "other" cover types.

The number of days since last snowfall (track days), weather conditions and pertinent information about snow cover were recorded each day of the study. Tracks were recorded on a Track Transect Data Sheet (Figure I).

The Park is divided into four areas (Figure II) primarily on the basis of topography. Divisions between the areas were roads, trails or waterways. The basic unit of measure is a function of the number of tracks in a given area, the length of transect sampled and the number of track days (days since snowfall). The formula used to calculate the indices is given below:

$$*TI = \frac{TTS_x}{[(L1 \times TD) + (L2 \times TD) + \ldots\ldots + (Ln \times TD)]} \times 100$$

TI - Track Indices
TTSx - Total tracks for Species X
Ln - Length of transect line n (Km)
TD - Track days or days since snow for Line N.
The percentage of each habitat type sampled is given in Appendices I and II.

TRACK TRANSECTS - FUNDY NATIONAL PARK

Date:_____ Transect No.:_____ Location:_____

Weather Conditions:_____

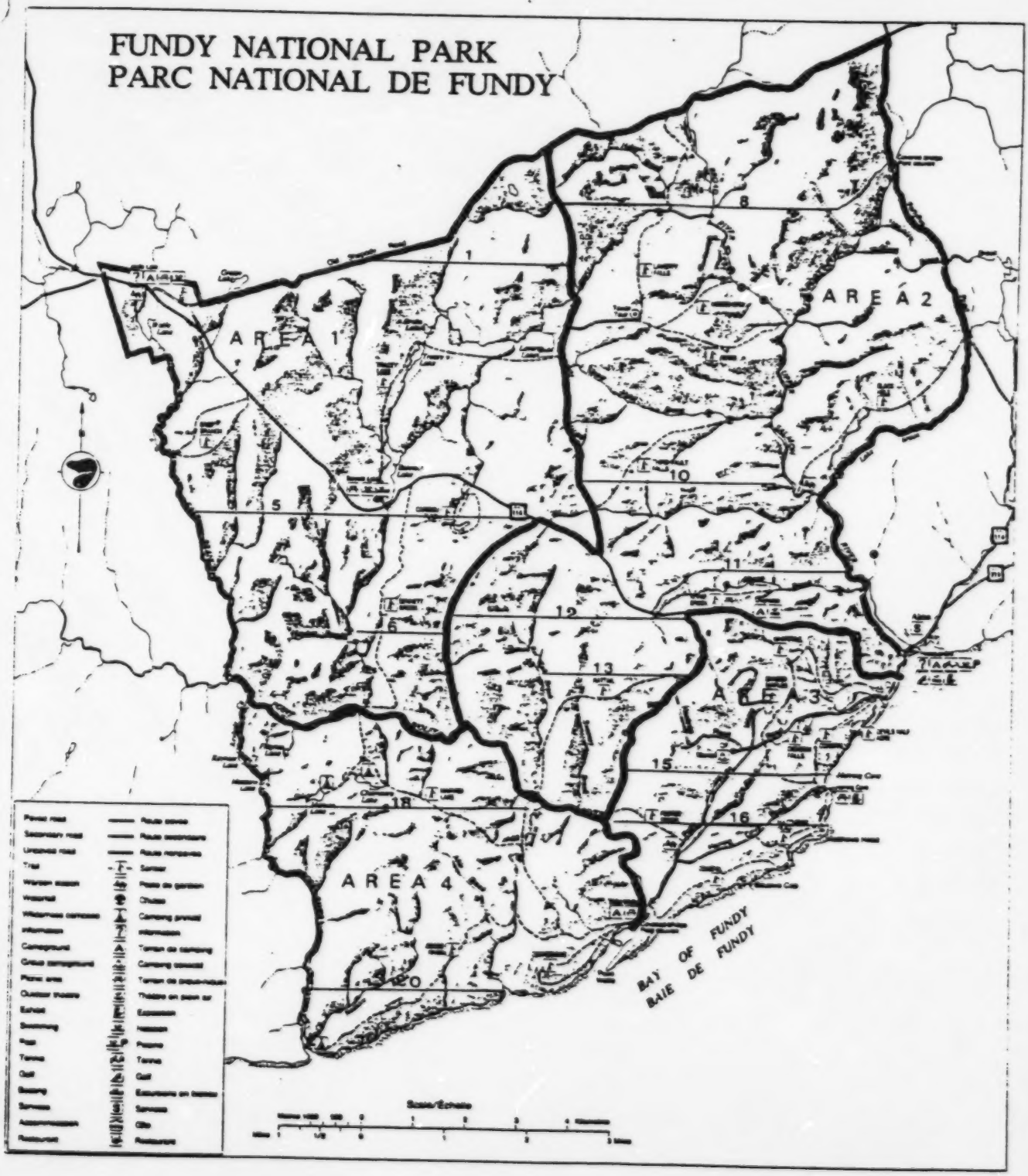
Snow Depth:_____cm Condition:_____

Days since last snow:_____ Observers:_____

SPECIES	COVER TYPES									
	SOFTWOOD		HARDWOOD		MIXED WOOD		OTHER			
	No.of tracks	Est.no. animals	No. of tracks	Est.no. animals	No.of tracks	Est.no. animals	No.of tracks	Est. no. animals	Specify*	Total
TOTAL										

*Other cover types = Alder, field, bog, etc.

FIGURE II. TRACK TRANSECTS AND AREAS 1-4



RESULTS

In 1986 the twelve transect lines that have been completed since 1982 were completed in February and the first week of March. The twelve lines completed were, 1, 5, 6, 8, 10, 11, 12, 13, 15, 16, 18 and 20 for a total of 50.07 kilometres. Thirty-one percent of the total transect length was through softwood, eight percent through hardwood, fifty-seven percent through mixed wood and four percent through "other" area. Snow depth during the transect period was 20-40 cm with the lesser amount on the coast in 1986.

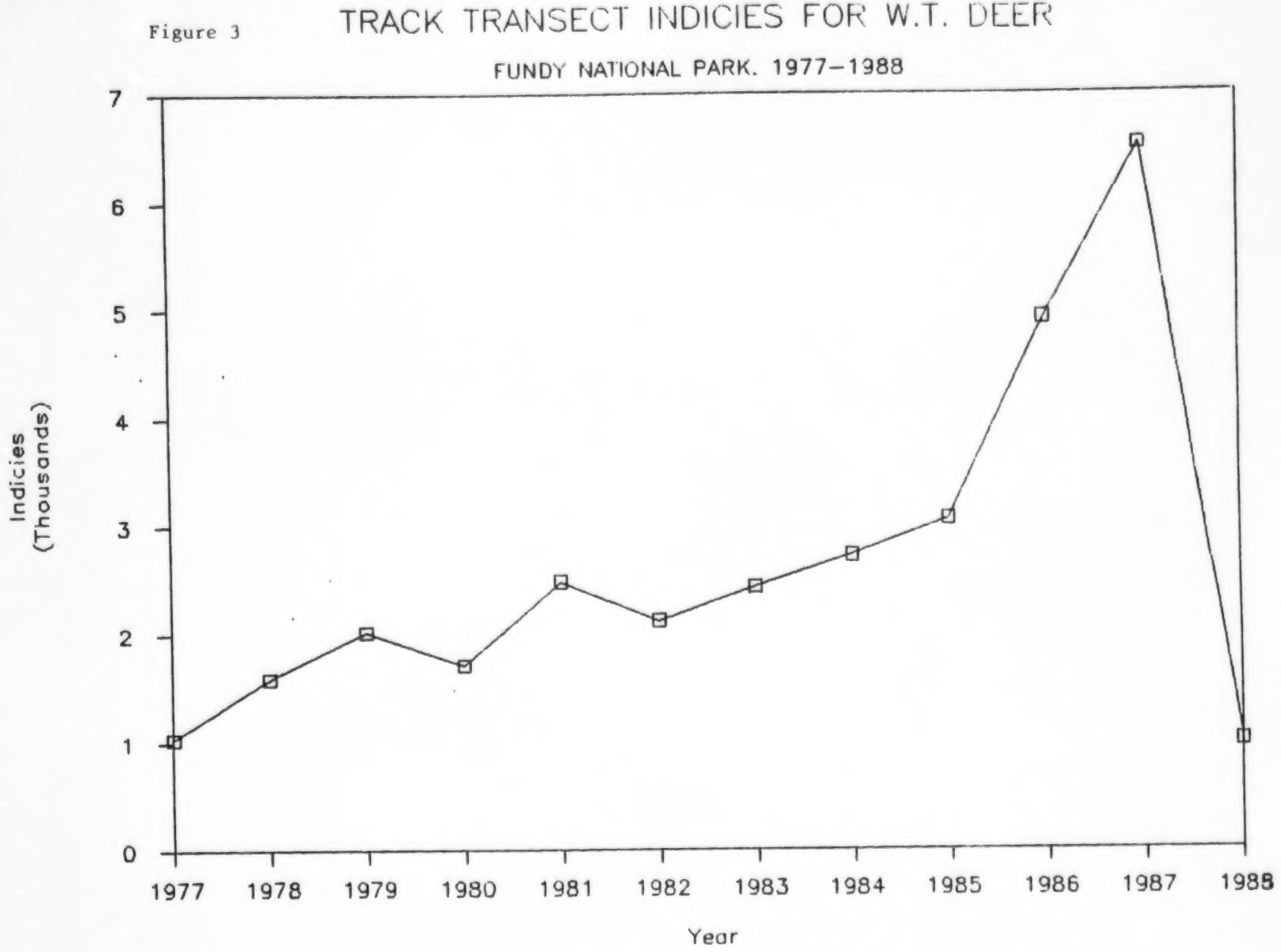
In 1987 the twelve transect lines were again completed during January to March when snow conditions permitted. Snow depth ranged from 35-100 cm. For this report, two years' data is being analyzed. A discussion of each mammal species and the relationship to data from previous years is given below.

White-tailed Deer (Figure 3)

Tracks of white-tailed deer were recorded in all areas of Fundy National Park. In 1986 white-tailed deer indices showed a sharp increase. Snowfall allowed deer to remain in most areas of the park. In 1987 white-tailed deer indices again increased. However, distribution changed with most of the deer moving to the coast.

Area III since 1977 has always had a high track indices for white-tailed deer. In 1987 the highest track indices for the whole park were recorded since track transects have been used to survey animal populations. In 1987 the high track indices for white-tailed deer in Area III indicates most of the deer

Figure 3


TRACK TRANSECT INDICIES FOR W.T. DEER
FUNDY NATIONAL PARK. 1977–1988
Indicies (Thousands)
0
1
2
3
4
5
6
7
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

population have yarded in the coastal area of the park. Heavy snowfall in January and early February caused the deer to stay to trails and to browse heavily in the coastal area. Later a heavy crust formed allowing the deer more mobility and permitting them to get more browse. Heavy browsing was noted of deer feeding on twigs 8mm diameter or more. This indicates a very low food supply. The high track indices for 1986 and 1987 indicate a high deer population in Fundy National Park.

Moose (Figure 4)

In 1986 moose tracks were observed in three areas of the park, these being Area I, II and IV, the same as 1985. In 1987 moose tracks were only observed in two areas, Area II and IV. Track indices still indicate moose populations remain low. Snow depths in 1987 were sufficient (>90 cm) to restrict movement of moose during the transect period.

Squirrel (Figure 5)

In 1986 and 1987 indices were highest in the softwood and hardwood stands and in Areas II and III, compared with III and IV in 1985. No distinction was made between red and flying squirrels.

In comparison to other years, 1986 was on the lower scale since 1977, although in 1987, the indices were slightly above the average for that period.

Figure 4

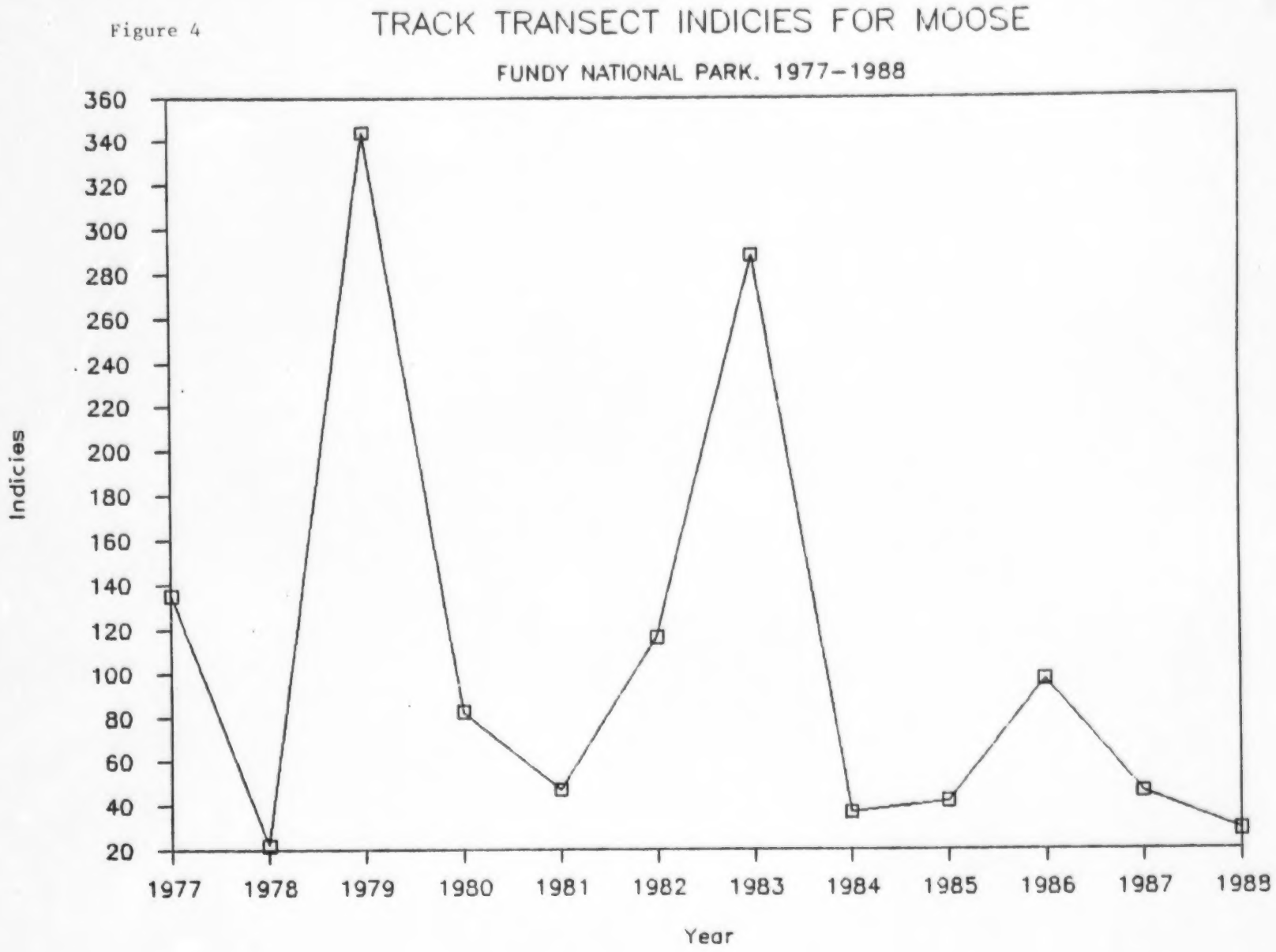
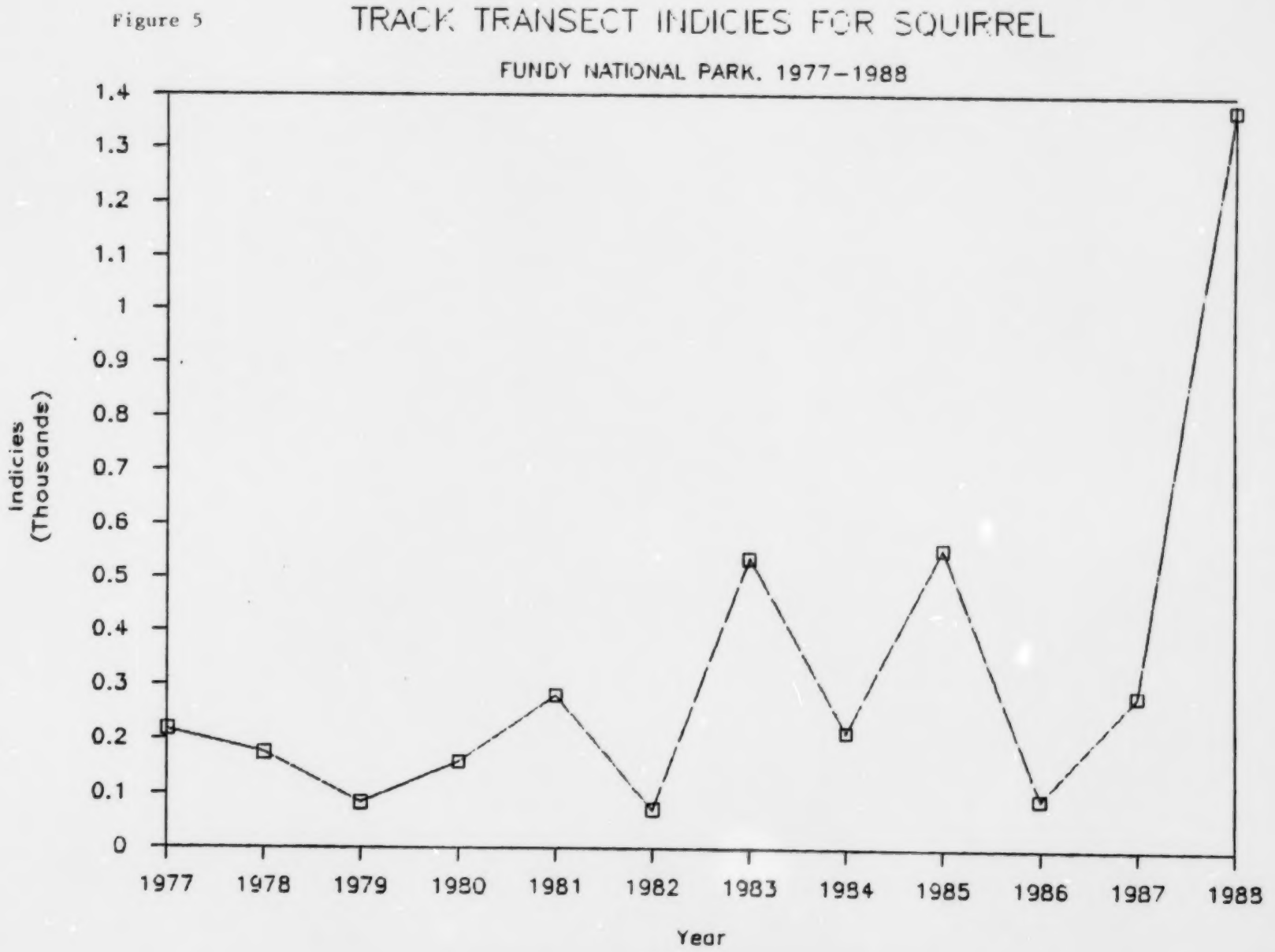

TRACK TRANSECT INDICIES FOR MOOSE
FUNDY NATIONAL PARK. 1977–1988
Indicies
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Figure 5


TRACK TRANSECT INDICIES FOR SQUIRREL
FUNDY NATIONAL PARK, 1977–1988
Indicies (Thousands)
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Porcupine (Figure 6)

Porcupine tracks were only recorded for Area III in 1986 and Areas I and III in 1987. Porcupine tracks were observed in the softwood stands in 1986 and the softwood and mixed wood stands in 1987.

In 1986 track indices indicate porcupine population may be on the increase, but in 1987 indices were the lowest since 1977.

Bobcat (Figure 7)

Bobcat tracks were recorded in Areas I and II in 1986 and no tracks were recorded in 1987. In 1985 Bobcat indices showed an increase but in 1986 indices were again low. Although no tracks were recorded in 1987 this does not mean no bobcat were in the park. Bobcat tracks were seen in the park, although no record of tracks were kept. (personal observation)

Red Fox (Figure 8)

Track indices for red fox were recorded in Area II in 1986 and 1987. Red fox tracks have been low since 1979 and since 1984 have remained low. It is difficult to account for the low recorded densities since 1980. There is a possibility of competition from Coyote which became established in the Park in 1979. The Fundy Coyote Study may give an answer to this questions.

Mice (Figure 9)

In 1986 track indices for mice was about the same as 1985 but were relatively lower in 1987. High mice indices were recorded in Area II in 1986 with Area III the highest in 1987. In 1987 snowfall on the ground was greater compared to 1986. Depth of snow on the ground is responsible for lower track indices, as mice only travel on the surface of snow under certain conditions.

Figure 6 TRACK TRANSECT INDICIES FOR PORCUPINE

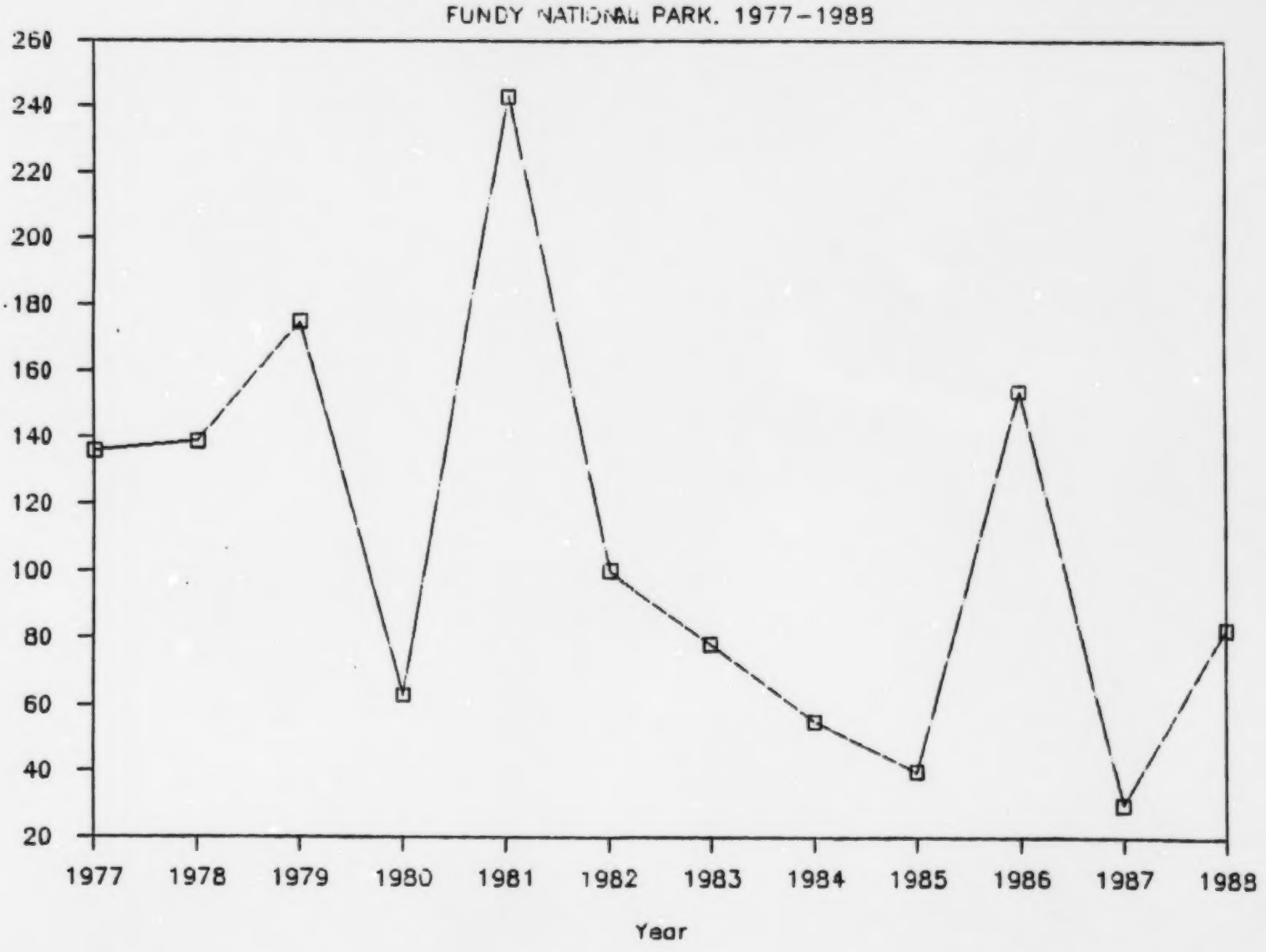


Figure 7

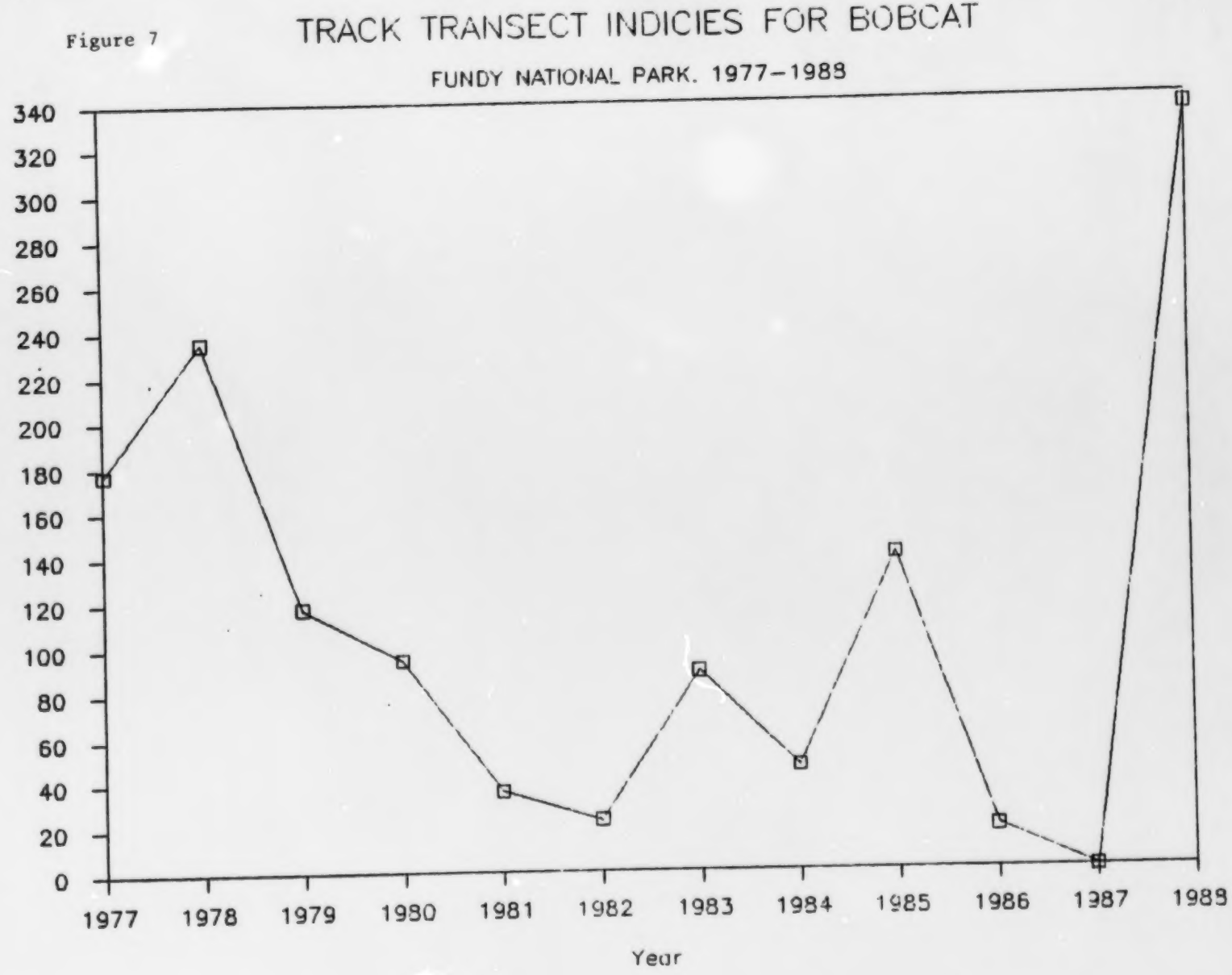

TRACK TRANSECT INDICIES FOR BOBCAT
FUNDY NATIONAL PARK. 1977–1988
Indicies
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Figure 8 TRACK TRANSECT INDICIES FOR FOX

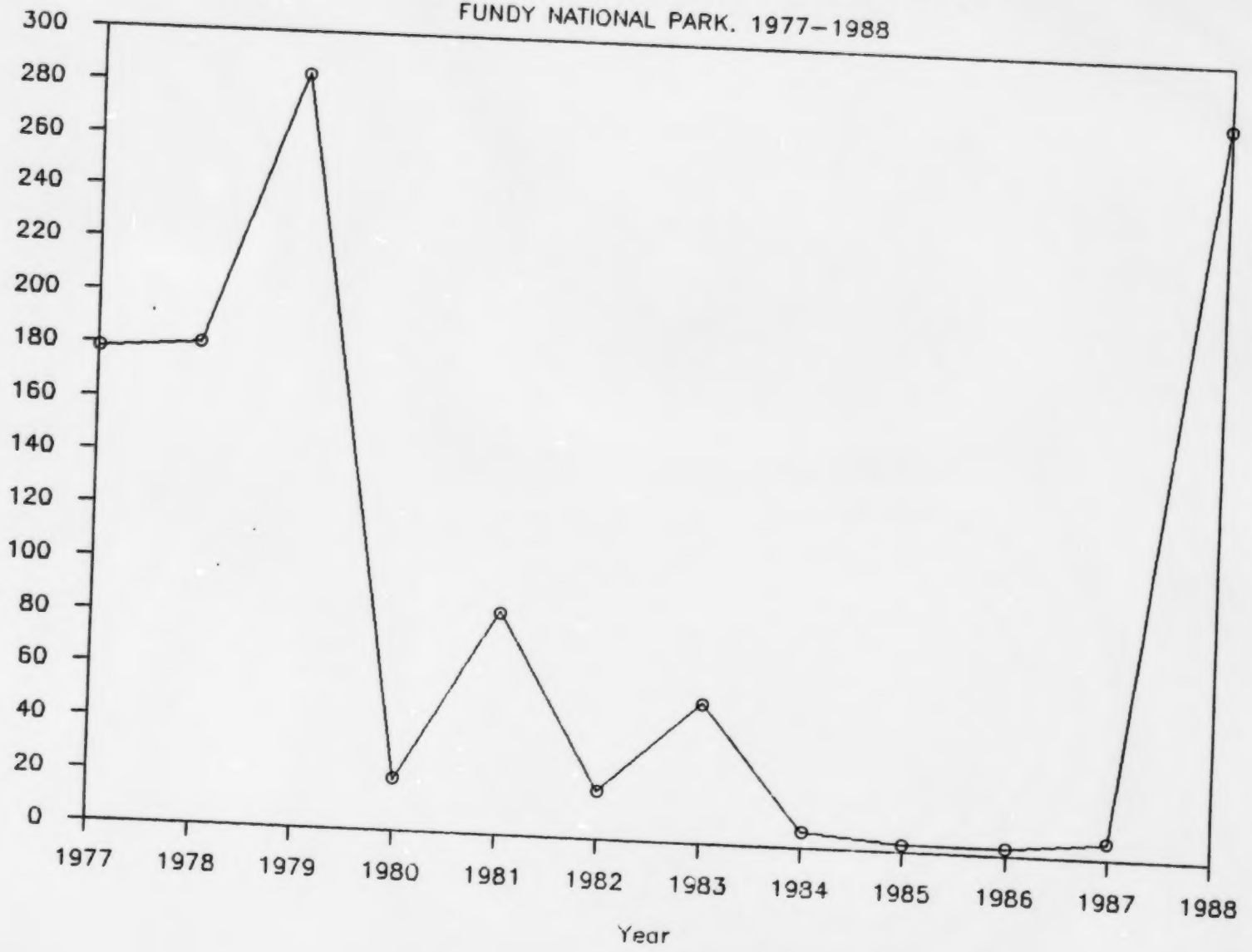
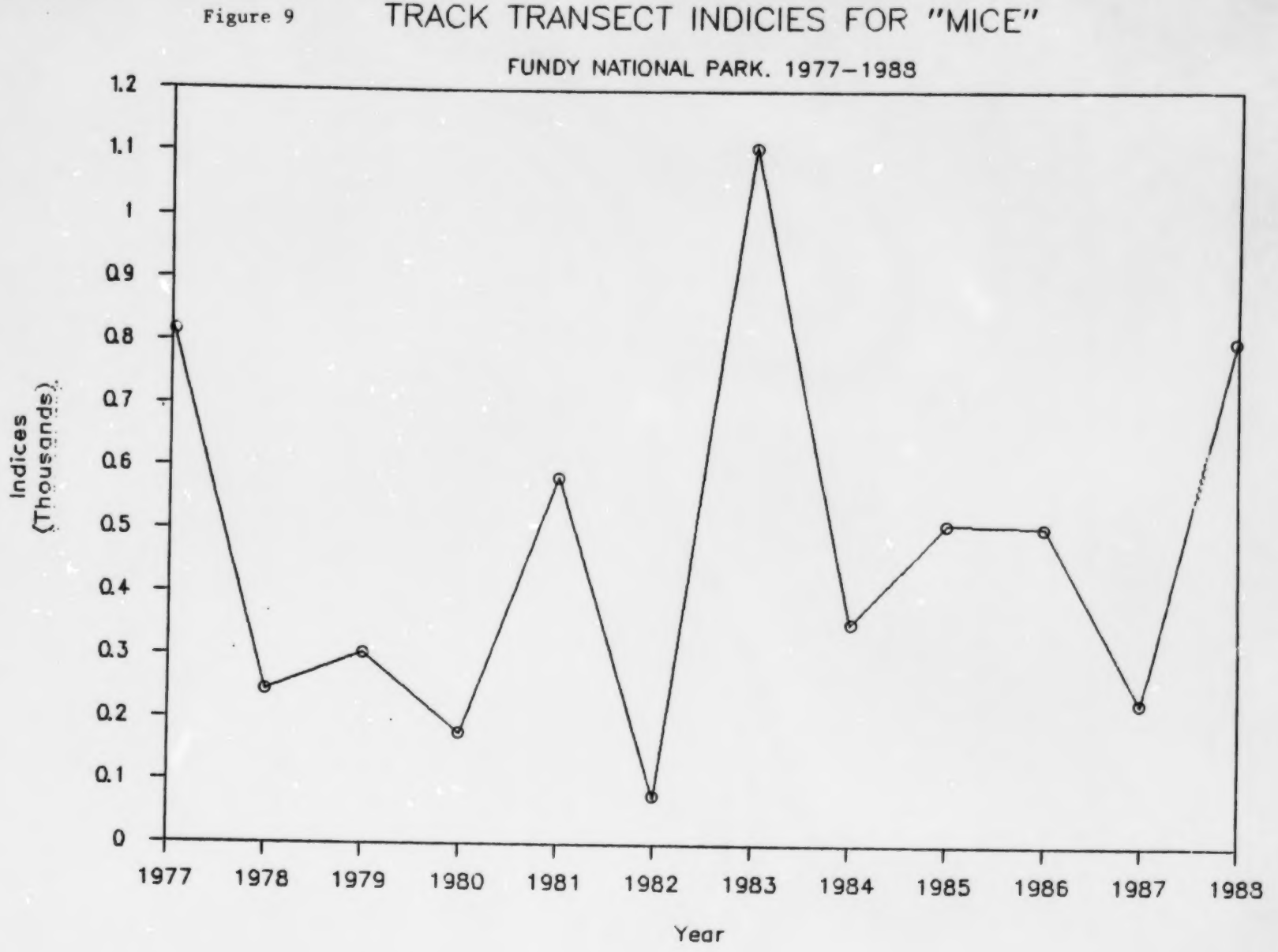


Figure 9


TRACK TRANSECT INDICIES FOR "MICE"
FUNDY NATIONAL PARK. 1977–1988
Indices (Thousands)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Fisher (Figure 10)

Fisher tracks were recorded in Areas I and IV in 1986 and only in Area II in 1987 compared to 1985 when fisher tracks were recorded in all areas. In 1987 the track indices for fisher were lowest since 1977. Fisher tracks have never been high so the park has a stable population of fisher.

Weasel (Figure 11)

Track indices for weasel have been recorded in all areas of the park both in 1986 and 1987. Indices for weasel population are average for the previous years, an indication that weasel population remains stable.

Mink (Figure 12)

Mink tracks were recorded in Area I in 1986 and in Area II in 1987. Mink track indices for 1986 and 1987 are in line with other years with exception of 1984.

American Otter (Figure 13)

No otter tracks were recorded in Fundy National Park on the track transect lines in 1986 or 1987. Otter is considered uncommon in the park. Tracks have been recorded in 1977, 1979, 1980 and 1984.

Lynx (Figure 14)

Tracks were recorded in 1978 and 1981 in Area II. No recent tracks have been sighted on track transect lines. The lynx would be considered uncommon in the park.

Figure 10

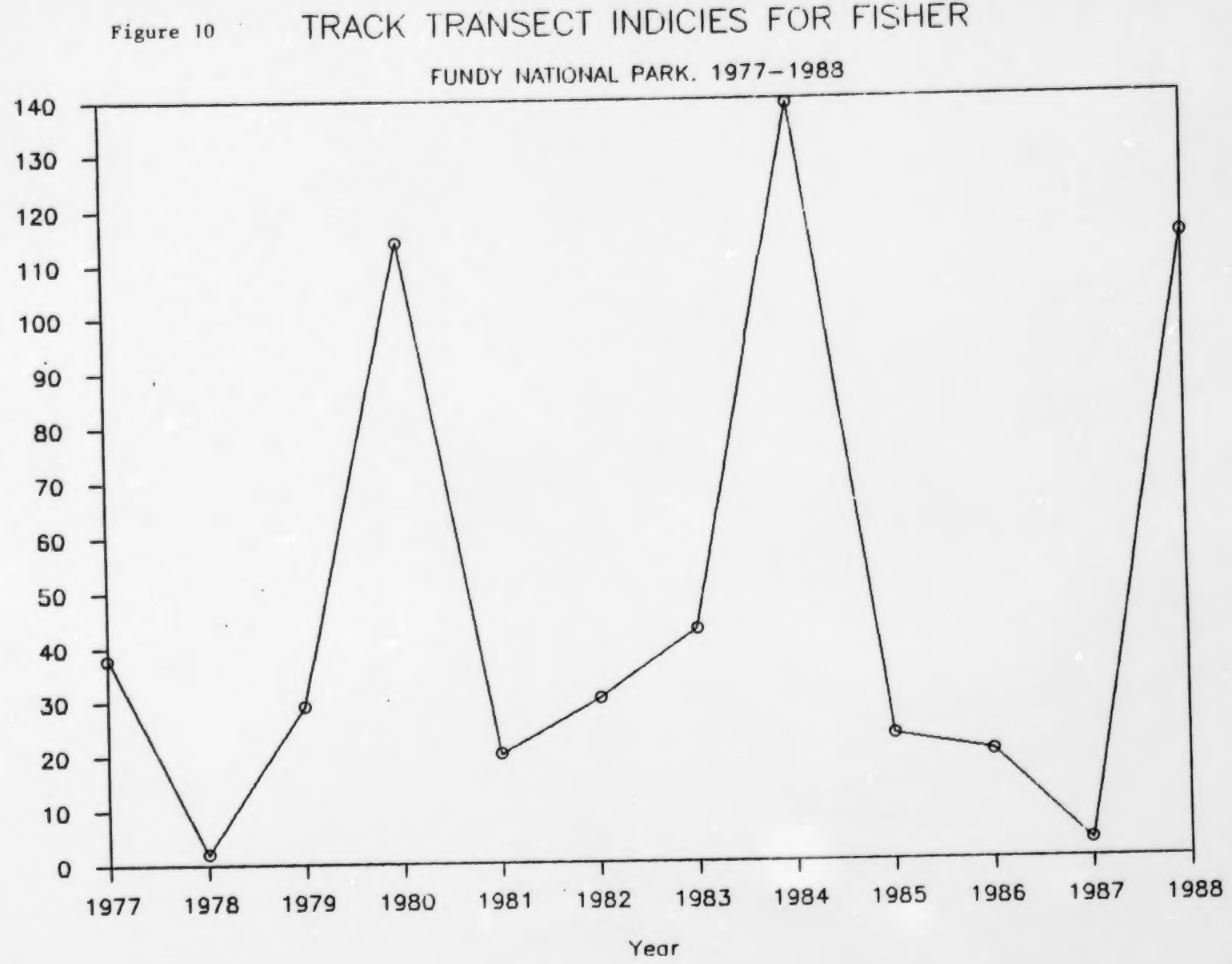

TRACK TRANSECT INDICIES FOR FISHER
FUNDY NATIONAL PARK. 1977-1988
Indices
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

FIGURE 11

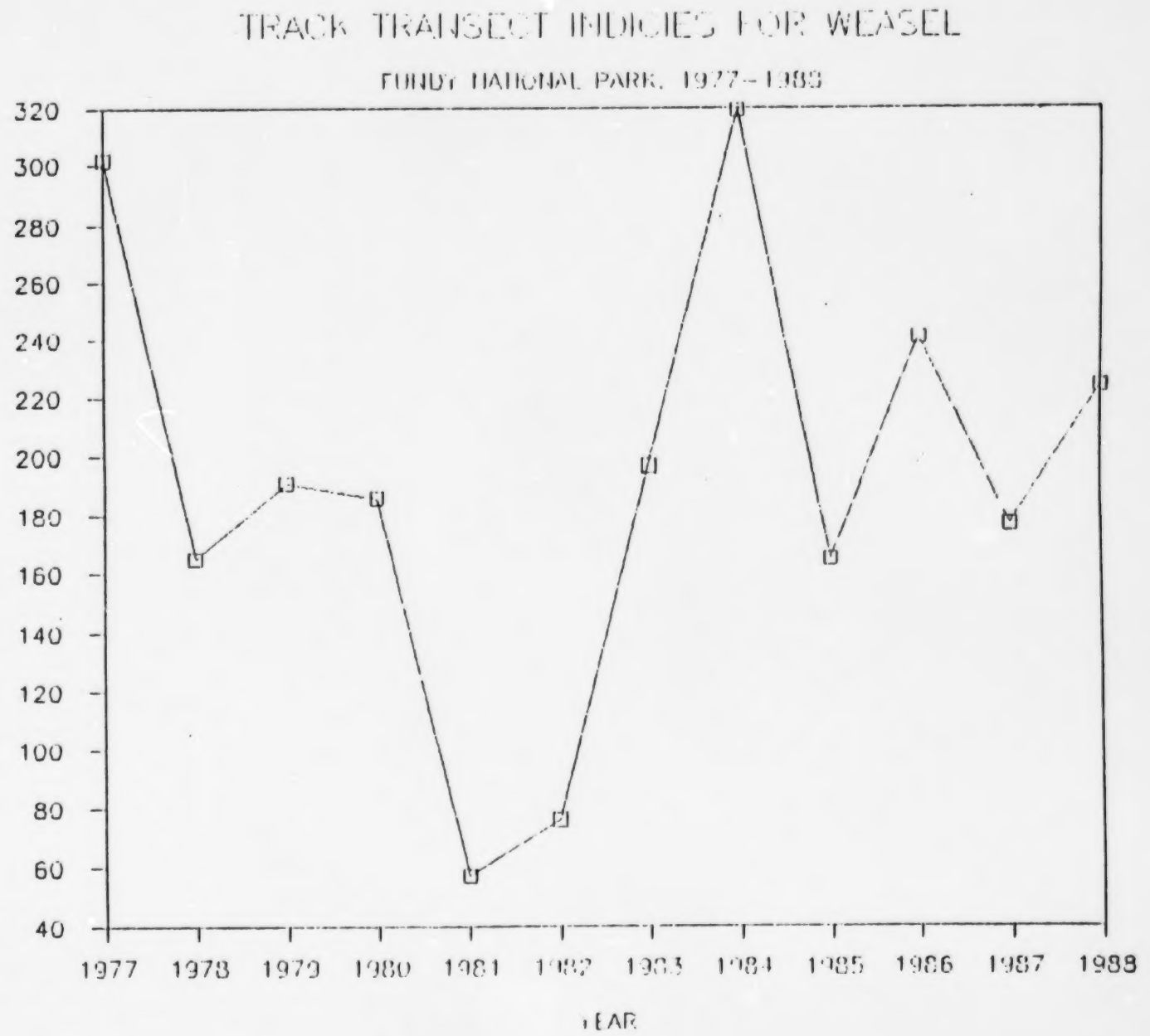

TRACK TRANSECT INDICIES FOR WEASEL
FUNDY NATIONAL PARK, 1977-1988
INDICIES
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
YEAR

Figure 12

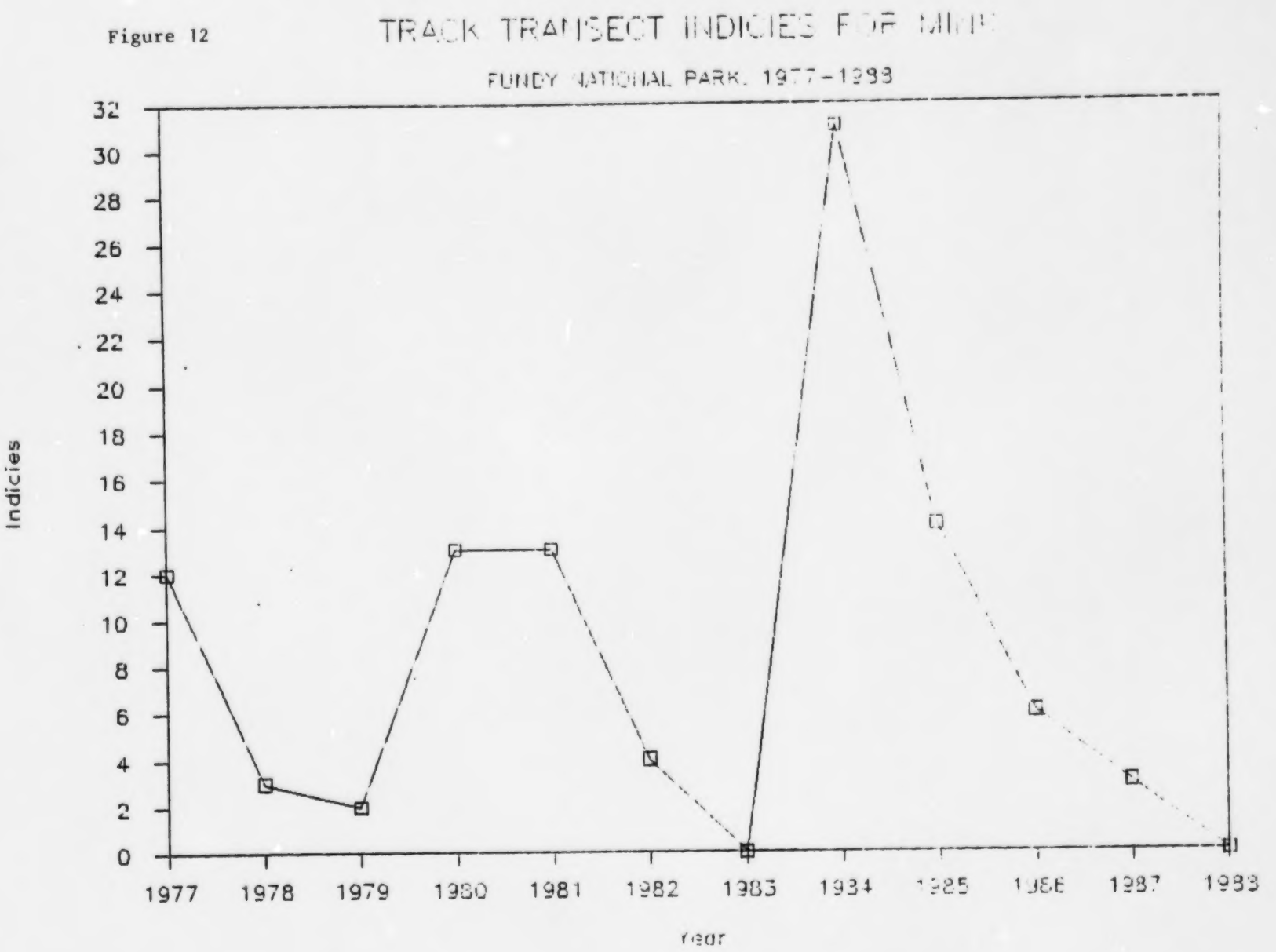

TRACK TRANSECT INDICIES FOR MINK
FUNDY NATIONAL PARK, 1977-1988
Indicies
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

FIGURE 13

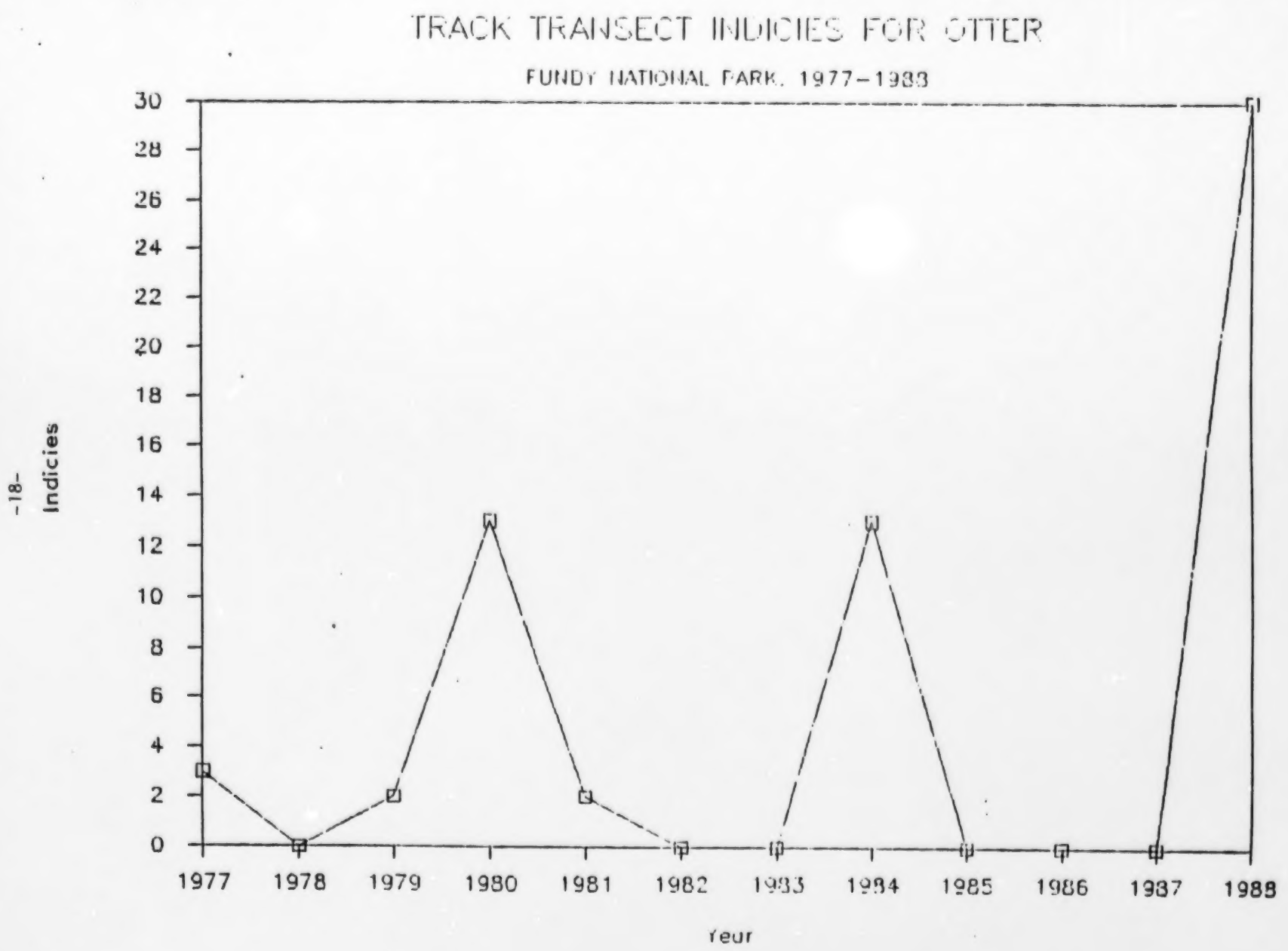
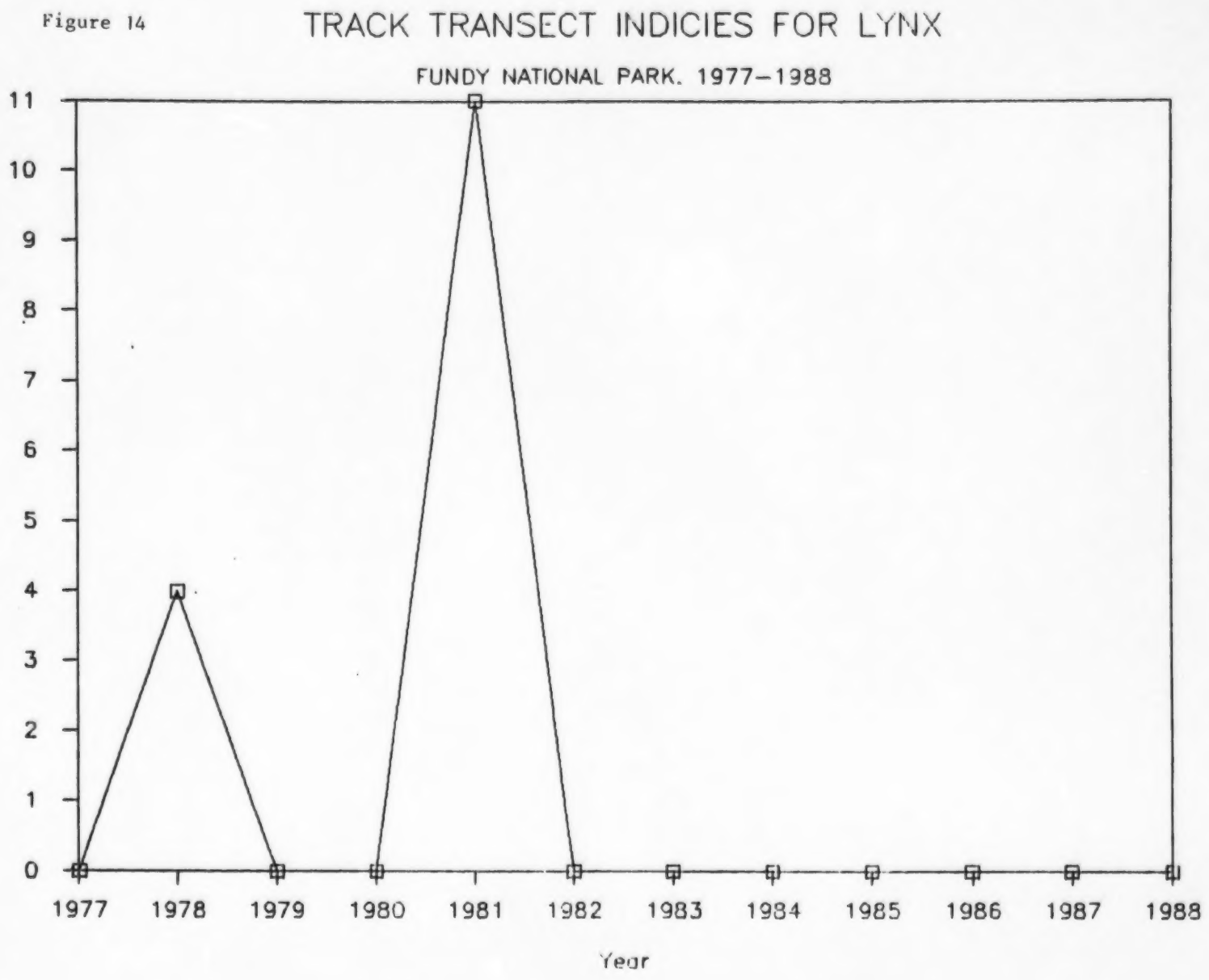

TRACK TRANSECT INDICIES FOR OTTER
FUNDY NATIONAL PARK, 1977-1988
Indicies
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Figure 14


TRACK TRANSECT INDICIES FOR LYNX
FUNDY NATIONAL PARK. 1977–1988
Indicies
11
10
9
8
7
6
5
4
3
2
1
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

American Marten (Figure 15)

Identification of marten tracks were recorded in Area I and Area IV in 1986 and Area I, II and IV in 1987. The reintroduction program was begun in 1984 with the release of 6 marten, of which 5 are thought to have survived. In 1985, 20 marten (15 adults and 5 young) were released. In 1986 no marten were released but 2 marten were released in the spring of 1987 and 2 marten in the fall.

Varying Hare (Figure 16)

In 1986 Area II had the highest track indices. In previous years, with the exception of 1984, Area III had the highest track indices but this was not the result in 1986. Area III was the lowest. In 1987 Area III had the highest track indices.

In 1986 track indices were low but in 1987 the track indices were the highest recorded since 1978, which shows a good hare population in all areas of the park.

Coyote (Figure 17)

Coyote tracks were recorded in all areas of the park in 1986 and 1987. In previous years the highest track indices were in the softwood stands of the park but in 1986 and 1987 the higher indices were in the hardwood stands.

The high hare population in 1986 and 1987 does not show a correlation with a high coyote population. Track indices for coyote appear to be stable since 1981 with the exception of 1984 when track indices were highest.

Coyote vocalization census was not conducted in 1985. The siren vocalization census carried out in the fall of 1986 showed 18 animals and the census for 1987 results were 33 to 40 coyotes for Fundy National Park.

Coyotes have a higher population of animals compared with bobcat and fox.

Figure 15 TRACK TRANSECT INDICIES FOR MARTEN

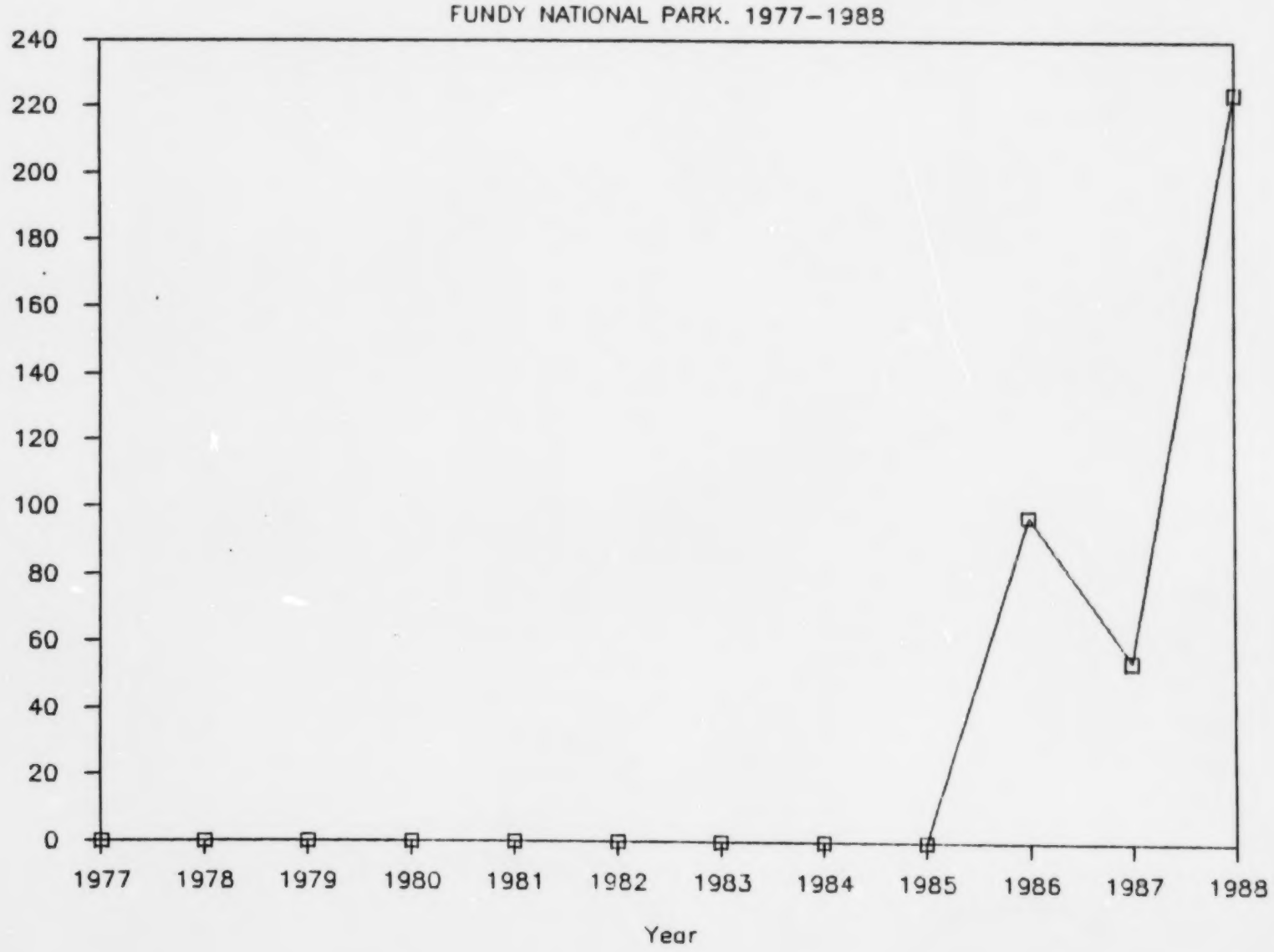


Figure 16

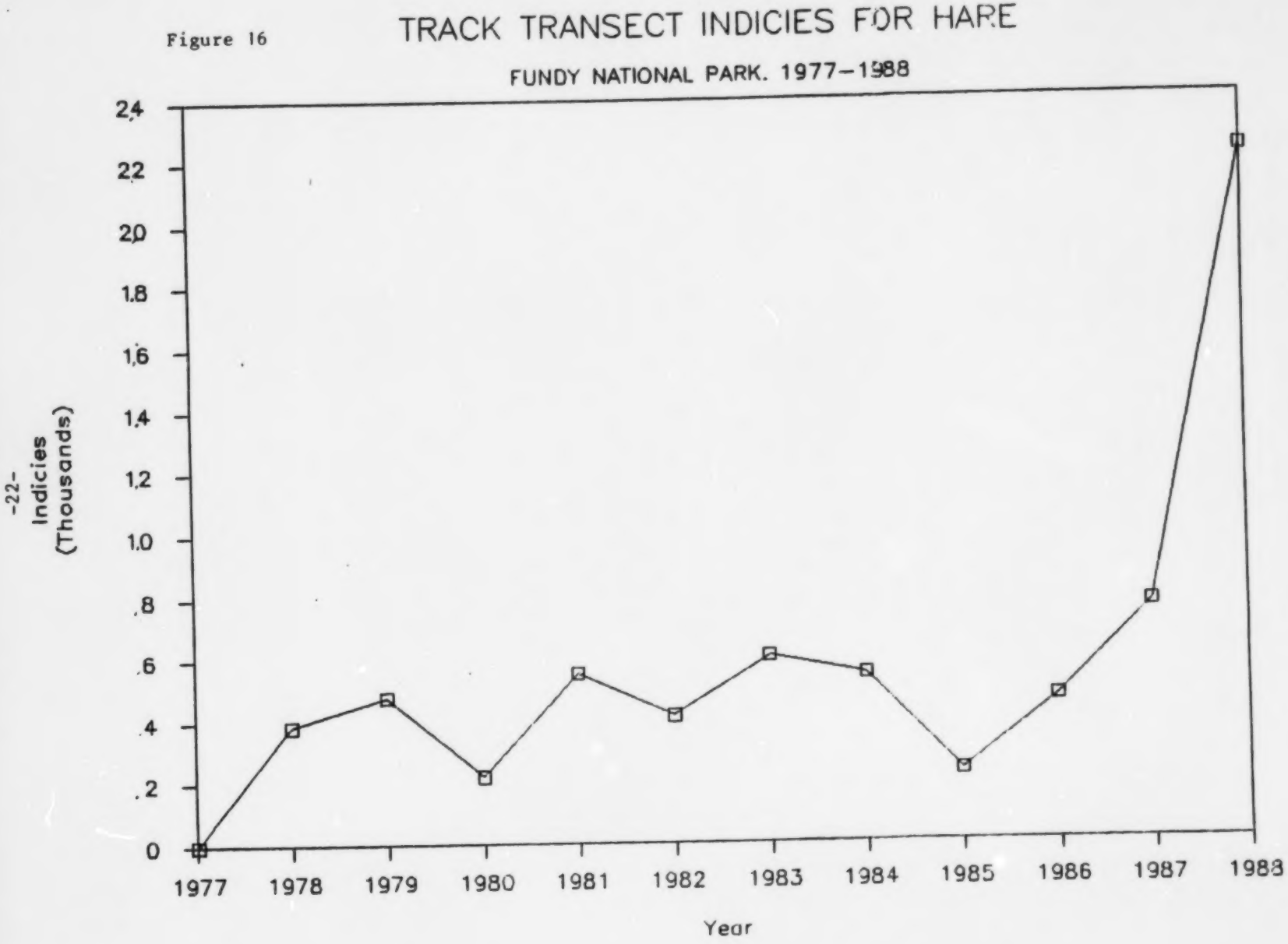

TRACK TRANSECT INDICIES FOR HARE
FUNDY NATIONAL PARK. 1977–1988
Indicies (Thousands)
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year

Figure 17 TRACK TRANSECT INDICIES FOR COYOTE

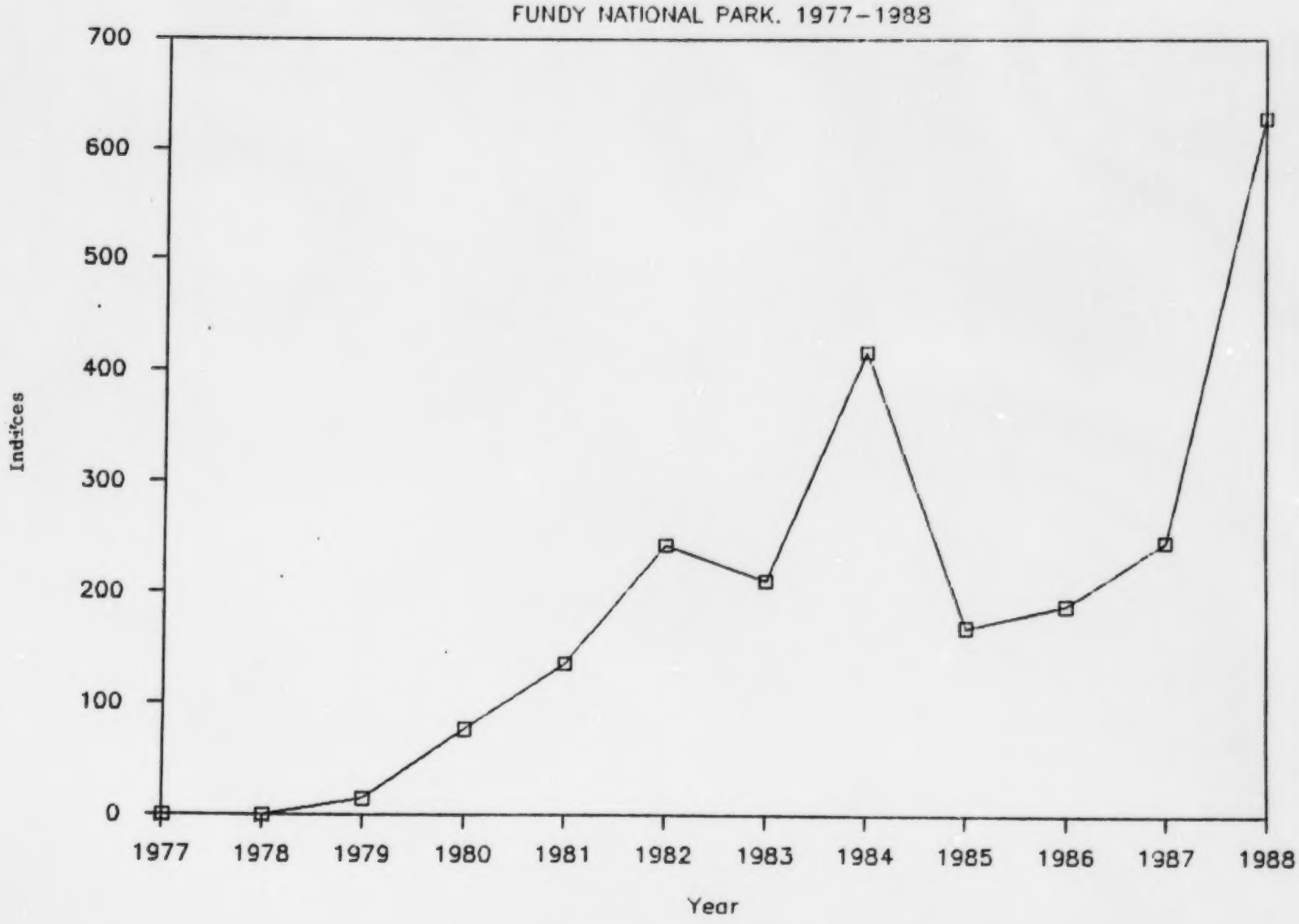


Figure 18

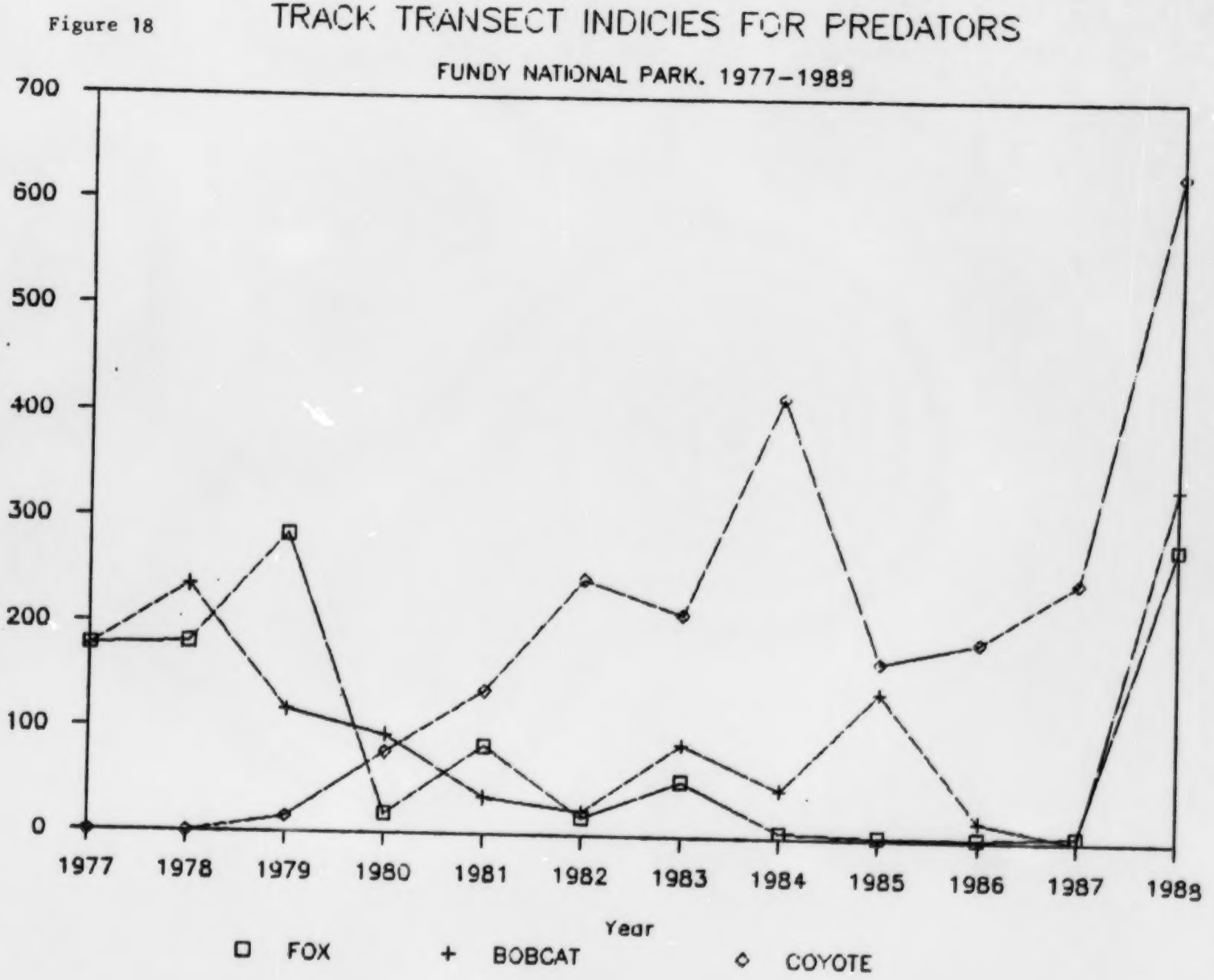
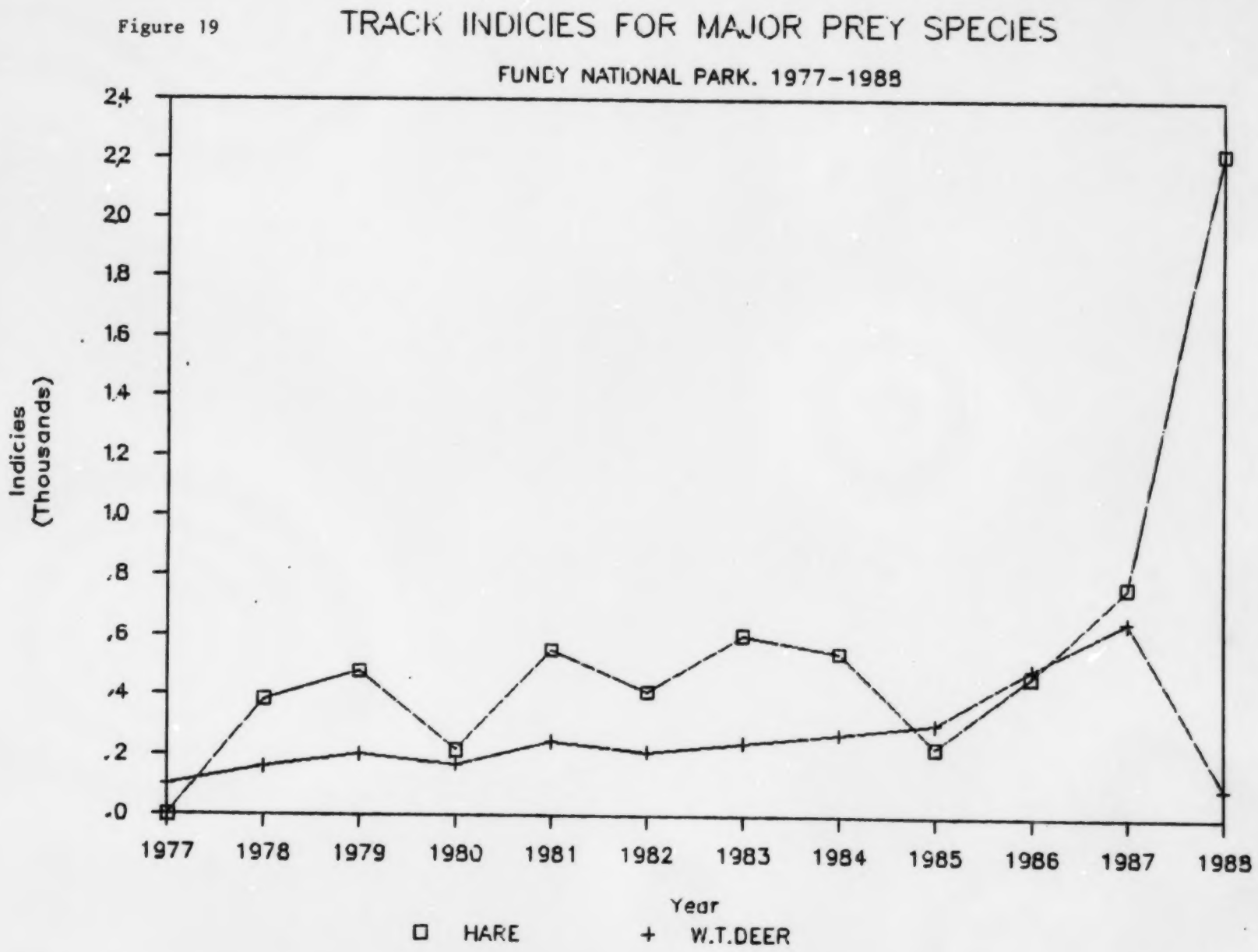

TRACK TRANSECT INDICIES FOR PREDATORS
FUNDY NATIONAL PARK. 1977-1988
Indicies
700
600
500
400
300
200
100
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year
FOX
BOBCAT
COYOTE

Figure 19


TRACK INDICIES FOR MAJOR PREY SPECIES
FUNDY NATIONAL PARK. 1977-1988
Indicies (Thousands)
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
Year
HARE
W.T.DEER

DISCUSSION

This progress report is an update of data for the years 1986 and 1987.

In February and the first week of March 1986 all the 12 transect lines were completed. Snow depth ranged from 20-40 cm in 1986.

The twelve transect lines were completed from January to March in 1987. Snow depth during the transect period was from 35-100 cm. The lighter snowfall was on the coast. Deer were located on all transect lines in 1986 and 1987. Heavy snowfall in 1987 caused the deer to yard and follow paths. In this period the deer were forced to browse heavily in the vicinity of the paths. Some browse eaten was over 8 mm in thickness (Warden obs.). Crust formed giving the deer better mobility and more browse.

Moose population still remains low in the park but deer and moose browsing areas are intermixing. Deer indices indicate a high deer population in the park. The highest indices in the park is in Area III which is on the coastal area of the park. In 1987 more deer migrated to the coast as indicated by Area III indices than in 1986, when there was a lighter snowfall. Indices for fox was low in 1986 and 1987 with only 1 fox track recorded in 1986 and 2 in 1987. Fox may be becoming uncommon in the park.

Bobcat indices still remain low in 1986 with no bobcat tracks recorded in 1987. This does not mean no bobcat was in the park as bobcat tracks were observed (Warden obs.).

Squirrel tracks were observed in all but Area IV in 1986. Indices for squirrel was down which indicates there may be a decline in population. In 1987 squirrel indices were about average for the previous years.

Weasel population may be one of the animals for which the indices indicate a stable population since 1977. Weasels are found in all areas of the park.

Mice indices in 1986 was about the same as 1985 but significantly down in 1987. Snow depth when track transects are done has a noted effect on the indices for this species. Snow depth in 1987 was greater than in 1986.

The track indices for fisher in 1986 was down slightly from 1985 and again in 1987. Fisher population had appeared to be stable but a high hare population could account for less travel for this species. Fisher tracks were observed in Areas I and IV in 1986 and only in Area II in 1987. Indices for mink is down in 1986 from 1985 and down in 1987 from 1986.

Track indices for varying hare was up in 1986 from 1985 and again in 1987 from 1986. It appears varying hare are on an increase. Varying hare indices in 1987 was one of the highest since 1978.

In 1986 coyote track indices was slightly above 1985 and again in 1987. Coyote population appears to have stabilized. The increase in coyote has marked a decrease in fox and bobcat. Most of the track transects were completed in February which is the breeding season for coyote. This did not appear to reflect in the track transect indices for travel.

The track indices for American marten was first recorded in 1986. The indices for 1987 was down from 1986 but we do not have enough data on track transects to give a population estimate. American marten tracks were located in Areas I and IV in 1986 and in Areas I, II and IV in 1987. Area III is not considered a good marten habitat area. Eleven different marten tracks were observed in 1986 with 17 different animals in 1987 (Warden obs.).

RECOMMENDATIONS

1. The track transect project should be continued in the future to provide information on relative mammal population densities.

2. The twelve transect lines that were surveyed this year namely, lines 1, 5, 6, 8, 10, 11, 12, 13, 15, 16, 18 and 20 should be the lines completed in future surveys to maintain a consistent record.

LITERATURE CITED

Sinclair, S., 1985, Winter Track Transect Report, Fundy National Park Library.

Bossé, Y., 1987, Trial Coyote Census, Fundy National Park Library.

Quann, D., 1986, American Marten Re-introduction Program, Fundy National Park Library.

Sinclair, G., 1987, Plan Update for the Reintroduction of the American Marten, Fundy National Park Library.

Appendix: I 1986

Track Days x Kilometres walked in each area, and the percentage that value was of the whole area.

	Softwood	Hardwood	Mixedwood	Other	Total Km x Track Days
AREA 1	4.68	3.13	9.14	0.44	17.39
	26.91%	17.99%	52.56%	2.53%	
AREA 2	9.75	4.51	23.45	1.5	39.21
	24.87%	11.50%	59.81%	3.83%	
AREA 3	2.31	0	4.97	1.14	8.42
	27.43%	0	59.03%	13.54%	
AREA 4	5.48	0	6.7	0	12.18
	44.99%	0	55.01%	0	

% Habitat use in area x = $\frac{\text{Total habitat transect length x Track days x 100}}{\text{Total area transect length x Track days}}$

Appendix: II 1987

Track Days x Kilometres walked in each area, and the percentage that value was of the whole area.

	Softwood	Hardwood	Mixedwood	Other	Total Km x Track Days
AREA 1	4.57	2.78	7.92	0.44	15.71
	29.09%	17.70%	50.41%	2.80%	
AREA 2	10.38	3.45	18.41	1.5	33.74
	30.76%	10.23%	54.56%	4.45%	
AREA 3	2.31	0	4.97	1.14	8.42
	27.43%	0	59.03%	13.54%	
AREA 4	8.87	0	12.98	0	21.85
	40.59%	0	59.41%	0	

% Habitat use in area x = $\frac{\text{Total habitat transect length x Track days x 100}}{\text{Total area transect length x Track days}}$

Appendix III

TRACK TRANSECTS - FUNDY NATIONAL PARK

Track Indices Per Area

1986

[redacted]te:_____ Transect No.:_____ Location:_____

[redacted]ther Conditions:_____

[redacted] Depth:_____cm Condition:_____

[redacted]ys since last snow:_____ Observers:_____

COVER TYPES

[redacted]PECIES	Area I		Area II		Area III		Area IV			Total	
	tracks	indices	tracks	indices	tracks	indices	tracks	indices	Total		
[redacted]sher	2	12	---	---	---	---	1	8	20		
Weasel	11	63	22	56	4	48	9	74	241		
[redacted]ce	16	92	125	319	4	48	6	49	508		
[redacted]x	0	0	1	3	0	0	0	0	3		
Mink	1	6	0	0	0	0	0	0	6		
[redacted]uirrel	2	12	18	46	3	36	0	0	94		
[redacted]-T. Deer	8	46	261	666	320	3800	50	410	4922		
[redacted]oose	2	12	1	3	0	0	10	82	97		
[redacted]bcat	1	6	5	13	0	0	0	0	19		
Porcupine	0	0	0	0	13	154	0	0	154		
[redacted]ter	0	0	0	0	0	0	0	0	0		
[redacted]bbit	198	1139	692	1765	43	511	152	1248	4663		
Lynx	0	0	0	0	0	0	0	0	0		
[redacted]yote	15	86	16	41	1	12	6	49	188		
[redacted]rten	14	81	0	0	0	0	2	16	97		
[redacted]											
[redacted]											
[redacted]											
[redacted]TOTAL											

[redacted]Other cover types = Alder, field, bog, etc.

Appendix IV

TRACK TRANSECTS - FUNDY NATIONAL PARK

Track Indices Per Stand

1986

[redacted]te:_____ Transect No.:_____ Location:_____

[redacted]ather Conditions:_____

[redacted]ow Depth:_____cm Condition:_____

[redacted]ays since last snow:_____ Observers:_____

COVER TYPES

[redacted]PECIES	SOFTWOOD		HARDWOOD		MIXED WOOD		OTHER			
	tracks	indices	tracks	indices	tracks	indices	tracks	indices	Specify*	Total
[redacted]isher	3	14	---	---	---	---	---	---		
Weasel	20	90	5	65	20	45	1	32		
[redacted]ce	45	203	67	877	39	88	---	---		
Fox	1	5	---	---	---	---	---	---		
Mink	---	---	---	---	---	---	1	32		
[redacted]uirrel	15	68	4	52	4	9	---	---		
Wh-T. Deer	461	2075	41	537	118	267	19	617		
[redacted]oose	10	45	2	26	1	2	---	---		
[redacted]bcat	4	18	---	---	2	5	---	---		
Porcupine	13	59	---	---	---	---	---	---		
[redacted]ter	---	---	---	---	---	---	---	---		
[redacted]bbit	838	3771	18	236	140	316	89	2890		
Lynx	---	---	---	---	---	---	---	---		
[redacted]yote	13	59	9	118	16	36	---	---		
Marten	8	36	---	---	8	18	---	---		
TOTAL										

[redacted]Other cover types = Alder, field, bog, etc.

Appendix V

TRACK TRANSECTS - FUNDY NATIONAL PARK

Track Indices Per Area
1987

te:_____ Transect No.:_____ Location:_____

ea her Conditions:_____

no Depth:_____cm Condition:_____

ays since last snow:_____ Observers:_____

COVER TYPES

PECIES	Area I		Area II		Area III		Area IV			Total
	tracks	indices	tracks	indices	tracks	indices	tracks	indices	Total	
isher	0	0	1	3	0	0	0	0	3	
Weasel	7	45	23	68	5	59	1	5	177	
ice	4	25	16	47	13	154	0	0	226	
Fox	0	0	2	6	0	0	0	0	6	
Mink	0	0	1	3	0	0	0	0	3	
quirrel	8	51	24	71	13	154	2	9	285	
Wt-T. Deer	54	344	25	74	504	5986	25	115	6519	
oose	0	0	3	9	0	0	8	37	46	
obcat	0	0	0	0	0	0	0	0	0	
Porcupine	1	6	0	0	2	24	0	0	30	
tter	0	0	0	0	0	0	0	0	0	
bbit	207	1318	352	1043	386	4584	161	738	7746	
Lynx	0	0	0	0	0	0	0	0	0	
yote	29	185	9	27	2	24	2	9	245	
arten	1	6	10	30	0	0	4	18	54	
TOTAL										

ther cover types = Alder, field, bog, etc.

Appendix VI

TRACK TRANSECTS - FUNDY NATIONAL PARK

Track Indices Per Stand

1987

te:_____ Transect No.:_____ Location:_____

ea her Conditions:_____

nc: Depth:_____cm Condition:_____

ays since last snow:_____ Observers:_____

COVER TYPES

PECIES	SOFTWOOD		HARDWOOD		MIXED WOOD		OTHER			
	tracks	indices	tracks	indices	tracks	indices	tracks	indices	Specify*	Total
Fisher	0	0	0	0	1	2	0	0		
Weasel	14	54	3	48	19	43	0	0		
ice	10	38	4	64	13	29	6	195		
Fox	0	0	0	0	2	5	0	0		
Mink	0	0	0	0	0	0	1	32		
uirrel	17	65	8	128	18	41	4	130		
Wh.-T. Deer	491	1881	6	96	99	224	12	390		
ose	0	0	0	0	10	23	1	32		
bcat	0	0	0	0	0	0	0	0		
Porcupine	0	8	0	0	1	2	0	0		
ter	0	0	0	0	0	0	0	0		
bbit	713	2732	80	1284	197	445	116	3766		
Lynx	0	0	0	0	0	0	0	0		
yote	7	27	13	209	15	34	7	227		
Marten	11	42	0	0	3	7	1	32		
TOTAL										

ther cover types = Alder, field, bog, etc.

APPENDIX VII TRACK INDICES PER AREA

SPECIES	AREA	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
FISHER	1	38	2	0	39	5	22	24	52	9	12	0
	2	0	0	29	4	15	8	11	69	6	0	3
	3	0	0	0	71	0	0	0	12	4	0	0
	4	0	0	0	0	0	0	8	6	4	8	0
TOTAL		38	2	29	114	20	30	43	139	23	20	3
WEASEL	1	104	103	26	78	42	17	63	58	18	63	45
	2	90	48	43	29	15	0	55	65	76	56	68
	3	47	5	112	79	0	59	71	178	32	48	59
	4	61	9	43	0	0	0	8	18	39	74	5
TOTAL		302	165	224	186	57	76	197	319	165	241	177
MICE	1	186	124	60	65	56	31	29	116	125	92	25
	2	161	27	92	110	457	17	584	44	157	319	47
	3	326	71	112	0	71	24	475	166	170	48	154
	4	154	22	177	0	0	0	24	24	59	49	0
TOTAL		827	244	441	175	584	72	1112	350	511	508	226
FOX	1	117	36	89	7	11	4	5	6	3	0	0
	2	54	59	191	12	73	14	48	0	0	3	6
	3	0	86	0	0	0	0	0	0	0	0	0
	4	7	0	17	0	0	0	0	0	0	0	0
TOTAL		178	181	297	19	84	18	53	6	3	3	6
MINK	1	10	0	2	13	2	4	0	6	6	6	0
	2	2	3	0	0	11	0	0	7	0	0	3
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	18	8	0	0
TOTAL		12	3	2	13	13	4	0	31	14	6	3

APPENDIX VII TRACK INDICES PER AREA

SPECIES	AREA	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
SQUIRREL	1	99	42	2	98	13	26	34	90	37	12	51
	2	32	46	39	29	128	26	110	46	110	46	71
	3	59	62	24	32	142	12	368	71	277	36	154
	4	29	26	82	0	0	9	27	9	133	0	9
TOTAL		219	176	147	159	283	73	539	216	557	94	285
W.T.DEER	1	71	13	42	416	45	40	227	181	310	46	344
	2	20	27	255	374	26	26	826	435	1377	666	74
	3	807	1539	1701	918	2417	1924	1069	2007	1318	3800	5986
	4	140	13	112	0	0	137	314	106	59	410	115
TOTAL		1038	1592	2110	1708	2488	2127	2436	2729	3064	4922	6519
MOOSE	1	20	15	36	13	14	0	102	0	24	12	0
	2	49	7	120	69	33	52	29	37	6	3	9
	3	59	0	177	0	0	0	0	0	0	0	0
	4	7	0	48	0	0	64	157	0	12	82	37
TOTAL		135	22	381	82	47	116	288	37	42	97	46
BOBCAT	1	51	2	40	33	7	0	0	0	0	6	0
	2	98	35	17	37	29	11	48	16	0	13	0
	3	24	86	59	24	0	12	36	24	139	0	0
	4	4	112	4	0	0	0	4	6	0	0	0
TOTAL		177	235	120	94	36	23	88	46	139	19	0
PORCUPINE	1	13	15	21	0	2	0	0	0	0	0	6
	2	27	22	17	8	4	5	11	7	0	0	0
	3	42	38	118	55	237	95	59	48	40	154	24
	4	54	64	82	0	0	0	8	0	0	0	0
TOTAL		136	139	238	63	243	100	78	55	40	154	30

APPENDIX VII TRACK INDICES PER AREA

SPECIES	AREA	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
OTTER	1	3	0	2	13	2	0	0	13	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0
TOTAL		3	0	2	13	2	0	0	13	0	0	0
V.HARE	1	0	869	1048	1404	276	708	401	1201	442	1139	1318
	2	0	297	1340	252	2283	956	1523	795	621	1765	1043
	3	0	1501	1087	530	2962	1675	3147	1390	800	511	4584
	4	0	1162	5696	0	0	788	976	2053	424	1248	738
TOTAL		0	3829	9171	2186	5521	4127	6047	5439	2287	4663	7683
LYNX	1	0	0	0	0	0	0	0	0	0	0	0
	2	0	4	0	0	11	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0
TOTAL		0	4	0	0	11	0	0	0	0	0	0
COYOTE	1	0	0	0	0	34	58	15	103	12	86	185
	2	0	0	15	29	55	100	70	136	34	41	27
	3	0	0	0	48	47	71	95	154	51	12	24
	4	0	0	0	0	0	14	31	24	71	49	9
TOTAL		0	0	15	77	136	243	211	417	168	188	245
P.MARTEN	1	0	0	0	0	0	0	0	0	0	81	6
	2	0	0	0	0	0	0	0	0	0	0	30
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	16	18
TOTAL		0	0	0	0	0	0	0	0	0	97	54

APPENDIX VIIITRACK INDICES PER STAND 1977-1987

SPECIES	HABITAT	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
FISHER	SOFTWOOD	36	2	25	32	13	16	22	155	13	14	0
	HARDWOOD	0	0	28	29	18	0	17	13	0	0	0
	MIXEDWOOD	0	0	0	0	5	8	7	4	3	0	2
	OTHER	30	0	0	0	0	0	0	0	4	0	0
WEASEL	SOFTWOOD	142	129	105	72	52	16	72	84	116	90	54
	HARDWOOD	45	6	0	103	18	14	51	126	13	65	48
	MIXEDWOOD	137	27	13	34	22	4	24	18	9	45	43
	OTHER	75	0	83	29	40	38	71	330	0	32	0
MICE	SOFTWOOD	277	104	186	16	68	12	347	113	292	203	38
	HARDWOOD	116	67	52	235	223	42	995	88	243	877	64
	MIXEDWOOD	401	40	45	34	252	18	97	28	25	88	29
	OTHER	181	0	95	57	81	0	424	256	70	0	195
FOX	SOFTWOOD	68	80	183	16	3	16	36	0	3	5	0
	HARDWOOD	33	0	84	0	9	0	34	0	0	0	0
	MIXEDWOOD	196	44	81	7	80	2	2	0	0	0	5
	OTHER	15	0	59	0	20	38	35	37	0	0	0
MINK	SOFTWOOD	0	4	2	0	0	0	0	21	8	0	0
	HARDWOOD	0	0	0	0	0	0	0	0	0	0	0
	MIXEDWOOD	0	0	0	0	5	2	0	4	1	0	0
	OTHER	75	0	0	57	40	38	0	0	0	32	32
SQUIRREL	SOFTWOOD	88	100	72	120	46	43	163	100	349	68	65
	HARDWOOD	45	36	0	59	62	42	34	113	38	52	128
	MIXEDWOOD	59	16	18	24	92	8	59	28	25	9	41
	OTHER	0	46	0	0	0	0	35	73	0	0	130

APPENDIX VIIITRACK INDICES PER STAND 1977-1987

SPECIES	HABITAT	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
W.T.DEER	SOFTWOOD	359	440	479	1420	137	730	980	1007	1980	2975	1881
	HARDWOOD	59	6	0	1144	0	0	354	113	730	537	96
	MIXEDWOOD	352	112	344	20	214	154	306	2789	208	267	224
	OTHER	30	254	201	286	61	1221	318	916	211	619	390
MOOSE	SOFTWOOD	30	18	105	120	20	43	83	63	31	45	0
	HARDWOOD	28	0	0	0	0	166	67	0	0	26	0
	MIXEDWOOD	29	3	123	0	27	18	92	2	1	2	23
	OTHER	90	0	0	114	0	0	0	0	0	0	32
BOBCAT	SOFTWOOD	38	96	55	112	23	4	18	25	90	18	0
	HARDWOOD	38	42	24	15	9	14	67	25	0	0	0
	MIXEDWOOD	186	19	10	0	13	6	17	0	0	5	0
	OTHER	75	0	0	57	0	0	0	73	0	0	0
PORCUPINE	SOFTWOOD	68	64	87	48	23	31	11	25	26	59	8
	HARDWOOD	12	12	16	29	0	0	17	0	0	0	0
	MIXEDWOOD	39	16	16	3	13	2	11	2	0	0	2
	OTHER	0	0	0	0	0	38	35	0	0	0	0
OTTER	SOFTWOOD	0	0	0	0	0	0	0	8	0	0	0
	HARDWOOD	0	0	0	0	0	0	0	0	0	0	0
	MIXEDWOOD	0	0	0	0	0	0	0	0	0	0	0
	OTHER	15	0	12	57	20	0	0	0	0	0	0
V.HARE	SOFTWOOD	0	1803	4867	1770	2249	1581	2540	3030	1571	3771	2732
	HARDWOOD	0	121	8	440	445	333	202	328	166	236	1284
	MIXEDWOOD	0	177	309	212	1668	604	420	417	60	316	445
	OTHER	0	1824	1763	857	120	1870	3781	1392	264	2893	3766

APPENDIX VIII TRACK INDICES PER STAND 1977-1987

SPECIES	HABITAT	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
LYNX	SOFTWOOD	0	14	0	0	0	0	0	0	0	0	0
	HARDWOOD	0	0	0	0	0	0	0	0	0	0	0
	MIXEDWOOD	0	1	0	0	8	0	0	0	0	0	0
	OTHER	0	0	0	0	0	0	0	0	0	0	0
COYOTE	SOFTWOOD	0	0	15	72	49	93	112	155	114	59	27
	HARDWOOD	0	0	0	59	89	28	0	227	13	118	209
	MIXEDWOOD	0	0	4	0	32	57	11	75	13	36	34
	OTHER	0	0	0	0	0	38	71	0	0	0	227
P.MARTEN	SOFTWOOD	0	0	0	0	0	0	0	0	0	36	42
	HARDWOOD	0	0	0	0	0	0	0	0	0	0	0
	MIXEDWOOD	0	0	0	0	0	0	0	0	0	18	7
	OTHER	0	0	0	0	0	0	0	0	0	0	32